GEOCENTRIC DATUM OF AUSTRALIA AND AUSTRALIAN BUREAU OF STATISTICS BOUNDARIES

WHAT IS THE GEOCENTRIC DATUM OF AUSTRALIA?

A datum is a reference which consists of a mathematical definition of the surface of the Earth and a point of origin. It provides the basis for the definition of a coordinate system. A datum, in conjunction with a cartographic projection, is used to create a flat representation of the features on the surface of the Earth and therefore allow the creation of cartographic maps. Australia in the past has used a variety of locally calculated datums as they provided a more accurate model of the Earth's surface. In 1966, a national datum called the Australian Geodetic Datum (AGD66) was adopted but local datums continued to be used. This datum was designed to be specific to Australia and would produce less accurate results when applied to different regions of the Earth. There was a minor update in 1984 (AGD84) associated with more accurate measurements of the Earth's surface around Australia derived from satellite data.

In 2000, with the increasing use of Global Positioning System (GPS) technologies, it was necessary to adopt a global rather than a national datum. This new datum is called the Geocentric Datum of Australia (GDA94). It allows for the development of a consistent coordinate system called the Map Grid of Australia (MGA94).

The transformation of digital data to GDA94 involves a significant shift, of about 200 metres to the north east, when compared to coordinates based on the older AGD66.

CONVERTING AUSTRALIAN BUREAU OF STATISTICS (ABS) BOUNDARIES TO GDA94

All new digital boundaries first released by the ABS after August, 2001 are based on GDA94. Although the GDA94 datum is compatible with GPS, GPS position fixes may not align precisely with ABS digital boundaries. GPS positions may be spatially less accurate than the boundaries in urban areas, and more accurate than the boundaries in remote areas. Care should therefore be taken when combining features mapped by GPS with ABS digital boundaries.

USING ABS BOUNDARIES ON GDA94

Users should be aware that older versions of mapping/GIS software may not be able to correctly interpret data based on GDA94. Some software may be able to interpret GDA94 data but may not align it correctly with other data based on earlier datums if the two are mapped together.

Users of MapInfo

In the MapInfo export format files (.mif/.mid files) supplied by the ABS, the datum is specified as 116 (GDA94). When these tables are imported into MapInfo, the software converts this to Datum 33 (Geodetic Reference System, 1980 - GRS80). GDA94 is one of a number of datums which are equivalent to GRS80. It is advisable to modify the MapInfo projection file (mapinfo.prj) so that the datum for GDA94 is listed above any other datum based on GRS80. If this is done, the correct datum will be displayed within MapInfo.

Users of versions of MapInfo 6.0 or later are able to load datasets based on GDA94 directly, without transformation. If using datasets based on two different datums, users are advised that loading the GDA94 dataset first will allow the software to adjust the non-GDA dataset to fit, provided it contains information specifying the datum on which it is based. If there is no information stating the

datum on which it is based, MapInfo will assume that it is on the same datum as the first dataset. This could cause alignment problems.

Versions of MapInfo earlier than 6.0 cannot interpret GDA94 correctly. Thus there will be alignment problems between datasets based on this datum and other earlier datums. For MapInfo users who do not intend to upgrade their software to Version 6.0 or later, it is possible to transform GDA94 data to earlier datums. Users should contact MapInfo Australia for assistance with conversion from GDA94 to earlier datums.

Users of ArcView

Different versions of ArcView handle GDA94 differently. Users should contact their software vendor to ascertain how to transform datasets within ArcView and how best to manage datasets on more than one datum.

Contact

Users with further queries about the information in this fact sheet can contact: geography@abs.gov.au.